



For control unit identification see parts microfiche, Group 54

**Engine 119.970/971 as of 01/91, engine 119.972 as of 09/92, engine 119.974 as of 01/92  
Engine 119.975 as of 10/92**

Engine	119.970/971/972/974/975		119.970/972	
Model	140.050/051/070/042/043 129.067, 124.036/034		140.050/051/070 129.067	
Version/Code	KAT/62/0		without KAT/828	
LH designation	4.1		4.1	
<b>Checking and adjusting idle</b> Op. no 07-2053 or 07-2056				
Selector lever position	P/N	D	P/N	D
Coolant temperature	>80		>80	
Engine oil temperature	60-80		60-80	
Engine speed	600-750	appr. 620 (M119.970/971) appr. 550 (M119.974/975) 500 ± 50 (M119.972)	600-750	appr. 620 (M119.970) 500 ± 50 (M119.972)
Ignition angle with 95 RON premium fuel	5-20 11)		5-20 11)	
On/off ratio	50		50	
Idle recognition (accelerator pedal not depressed)	50 ± 10 1) ON 12)		- ON	

1) In the case of complaints the lambda control must be measured with the regeneration line (to the engine) disconnected and sealed off at idle speed and at 2500 rpm.

11) See Testing EZL

12) LH-EFP connection line: - in the case of discontinuity or short-circuit to positive - constantly "OFF"  
- in the case of short-circuit to ground - constantly "OFF".

**Engine 119.970/971 as of 01/91, engine 119.972 as of 09/92, engine 119.974 as of 01/92  
Engine 119.975 as of 10/92**

Engine	119.970/971/972/974/975		119.970/972	
Model	140.050/051/070/042/043 129.067, 124.036/034		140.050/051/070 129.067	
Version/Code	KAT/62/0		without KAT/828	
LH designation	4.1		4.1	
<b>Testing and adjusting engine</b> Op. no. 07-1100				
Throttle valve angle	0.3-2		0.3-2	
Coolant temperature	>80		>80	
Engine oil temperature	60-80		60-80	
Engine speed (selector lever pos. P/N)	600-750		600-750	
Injection time	3-5		3-5	
Air mass	20-28		20-28	
Hot wire voltage	1.3-1.7		-	
Oxygen sensor voltage (varies around 300 mV after 2 mins.)	-200 to +1000		-	
On/off ratio	30		-	
Self-adaptation, air at idle	50 ± 10 1) 0 ± 2 3)		-	
Self-adaptation factor, lower/upper part-load	0.9-1.1 4)		-	
Ignition angle with 95 RON premium fuel	5-20 5) 10)		5-20 5) 10)	
Resistance trimming plug	2)		2)	
Air pump after start, max. 20 sec.	<40 °C ON		-	
Regeneration, intake air > 46 °C	ON		-	
Exhaust gas recirculation, air mass > 130 kg/h	ON		-	
Safety fuel shut-off > 1100 rpm	OFF		OFF	
Cylinder shut-off/misfiring	13)		13)	

1) In the case of complaints the lambda control must be measured with the regeneration line (to the engine) disconnected and sealed off at idle speed and at 2500 rpm.

2) Correction position for LH resistance trimming plug, see page 32/9. USA: display ".F"

3) Idle speed basic setting, 0.0 kg/h (Bosch) (VDO). Mixture tendency "rich" < 0.0 kg/h. Mixture tendency "lean" > 0.0 kg/h.

4) Part-load basic setting = 1.0. Mixture tendency "rich" < 1.0 kg/h. Mixture tendency "lean" > 1.0 kg/h.

5) Testing EZL, see next page.

10) In the case of complaints check ignition angle at 2500 ± 200 rpm, specification 38 - 45° or check ignition angle under load.

13) Faulty cylinder highlighted. Further tests with engine diagnosis tester.

**Engine 119.970/971 as of 01/91, engine 119.972 as of 09/92, engine 119.974 as of 01/92  
Engine 119.975 as of 10/92**

Engine	119.970/971/972/974/975		119.970/972	
Model	140.050/051/070/042/043 129.067, 124.036/034		140.050/051/070 129.067	
Version/Code	KAT/62/0		without KAT/828	
LH designation	4.1		4.1	

Testing and adjusting engine (EZL) Op. no. 07-1100		
Coolant temperature.....°C	>80	>80
Engine oil temperature.....°C	60-80	60-80
Engine speed (selector lever pos. P/N).....rpm	600-750	600-750
Intake air temperature.....°C	<30	<30
Barometric pressure.....mbar	see barometer	see barometer
Ignition angle with 95 RON premium fuel.....°CA	5-20 <sup>10)</sup>	5-20 <sup>10)</sup>
EZ resistance trimming coupling.....Readout	6)	6)
Transmission overload protection switch (selector lever pos. P/N).....Readout	OFF	OFF
Voltage at LH control unit terminal 30.....V	11-14	11-14
Intake manifold pressure.....mbar	550-650	550-650
Anti-knock control active.....Readout	OFF	OFF
Knock ignition angle/cyl.....°CA	0.0	0.0
Spark voltage/cyl.....V	25-70 <sup>14)</sup>	25-70 <sup>14)</sup>
Spark duration/cyl.....ms	1.5-1.9 <sup>14)</sup>	1.5-1.9 <sup>14)</sup>
Spark duration difference between cylinders.....ms	≤0.3 <sup>14)</sup>	≤0.3 <sup>14)</sup>

6) See EZL resistance trimming coupling

10) In the case of complaints check ignition angle at 2500 ± 200 rpm, specification 38 - 45° or check ignition angle under load.

14) Readout only with Bosch control unit

**Engine 119.970/971 as of 01/91, engine 119.972 as of 09/92, engine 119.974 as of 01/92  
Engine 119.975 as of 10/92**

Engine	119.970/971/972/974/975	119.970/972
Model	140.050/051/070/042/043 129.067, 124.036/034	140.050/051/070 129.067
Version/Code	KAT/62/0	without KAT/828
LH designation	4.1	4.1
<b>Cold start</b>		
Coolant temperature.....°C	7)	7)
Engine speed.....rpm	7)	7)
Starter signal terminal 50, during starting.....Readout	ON	ON
Post-start enrichment < 70° max. 20 sec.....Readout	ON	ON
Idle speed recognition (accelerator pedal not depressed).....Readout	ON	ON
Voltage at LH control unit terminal 30.....V	11-14	11-14
Fuel pump.....Readout	ON	ON
<b>Warming up</b>		
Selector lever position.....°C	P/N	P/N
Coolant temperature.....°C	bis 65	bis 65
Engine speed (Engine speed higher during warm-up).....rpm	1000 ± 100 falls continuously to 600-750	1000 ± 100 falls continuously to 600-750
Warming up.....Readout	<70 °C ON >70 °C OFF	<70 °C ON >70 °C OFF
Idle speed recognition (accelerator pedal not depressed).....Readout	ON <sup>12)</sup>	ON <sup>12)</sup>
Air pump after > 20 sec.....Readout	OFF	OFF
Intake air temperature.....°C	>20	>20

7) Proceed on a complaint-related or temperature-dependent basis

12) LH-EFP connection line: - in the case of discontinuity or short-circuit to positive - constantly "OFF"  
- in the case of short-circuit to ground - constantly "OFF"

**Engine 119.970 as of 01/91  
Engine 119.972 as of 09/92**

Engine	119.970	119.970	119.972	119.972
Model	140.050/051/070	140.050/051/070	129.067	129.067
Version/Code	KAT/62/0	without KAT/828	KAT/62/0	without KAT/828
LH designation	4.1	4.1	4.1	4.1

Testing engine output <sup>8)</sup> and exhaust emissions				
Op. no. 07-1203 or 07-1206				
Engine speed	rpm	5500	5500	5500
Ignition angle with 95 RON premium fuel	°CA	23-28	23-28	23-28
Injection time	ms	12-17	12-17	12-17
Air mass	kg/h	910-990	910-990	910-990
Hot wire voltage	V	-	-	-
Barometric pressure	mbar	see barometer	see barometer	see barometer
Full-load recognition	Readout	ON	ON	ON
Acceleration enrichment	Readout	ON	OFF	ON
Decel fuel shut-off > 2100 rpm	Readout	ON	ON	ON
Camshaft adjustment > 2000 rpm	Readout	OFF	ON	OFF
Road speed signal	km/h	>100	>100	>100
Shift point retard	Readout	OFF	OFF	OFF
Automatic transmission drive mode 3	kW	182 <sup>9)</sup>	182 <sup>9)</sup>	177
Full-load, 3rd gear/drive mode 3	% CO	-	2.0-5.0	-

<sup>8)</sup> The test values are minimum outputs. Speed not higher than 130 km/h; use workshop's own test tires.



Test output only with simulated coolant temperature of 80 °C (use 2 ohm decades or special tool 140 589 09 21 00 and 140 589 10 21 00).

<sup>9)</sup> Without full-load enrichment

**Note**

Ignition angle correction, see page 32/8.

**Engine 119.971 as of 01/91, engine 119.974 as of 01/92, engine 119.975 as of 10/92**

Engine	119.971	119.974	119.975
Model	140.042/043	124.036	124.034
Version/Code	KAT/62/0	KAT/62/0	KAT/62/0
LH designation	4.1	4.1	4.1
Testing engine output <sup>8)</sup> and exhaust emissions			
Op. no. 07-1203 or 07-1206			
Engine speed	rpm	5500	5500
Ignition angle with 95 RON premium fuel	°CA	23-28	18-22
Injection time	ms	12-17	12-17
Air mass	kg/h	910-990	910-990
Hot wire voltage	V	-	-
Barometric pressure	mbar	see barometer	see barometer
Full-load recognition	Readout	ON	ON
Acceleration enrichment	Readout	ON	OFF
Camshaft adjuster > 2000 rpm	Readout	OFF	ON
Road speed signal	km/h	>100	>100
Decel fuel shut-off > 2100 rpm	Readout	ON	ON
Shift point retard	Readout	OFF	OFF
Automatic transmission drive mode 3	kW	158 <sup>9)</sup>	177
Full-load, 3rd gear/drive mode 3	% CO	-	-

<sup>8)</sup> The test values are minimum outputs. Speed not higher than 130 km/h; use workshop's own test tires.



Test output only with simulated coolant temperature of 80 °C (use 2 ohm decades or special tool 140 589 09 21 00 and 140 589 10 21 00).

<sup>9)</sup> Without full-load enrichment

**Note**

Ignition angle correction, see page 32/8.

**Engine 119.970/971 as of 01/91, engine 119.972 as of 09/92, engine 119.974 as of 01/92  
Engine 119.975 as of 10/92**

Engine	119.970/971/972/974/975	119.970/972
Model	140.050/051/070/042/043 129.067, 124.036/034	140.050/051/070 129.067
Version/Code	KAT/62/0	without KAT/828
LH designation	4.1	4.1
Exhaust emission values (without KAT)		
Engine speed	rpm	600-750
Idle speed exhaust emission value	% CO	1.5±0.5
Engine speed	rpm	3500
Full-load in 3rd gear/drive mode 3	% CO	1.5
Upper part-load, 4th gear/selector lever pos. D, 120 km/h, 24 kW	% CO	<1.0
Lower part-load, 4th gear/selector lever pos. D, 50 km/h, 7 kW	% CO	<1.0
Exhaust gas backpressure	mbar	<300

**Engine 119.970/971 as of 01/91, engine 119.972 as of 09/92, engine 119.974 as of 01/92, engine 119.975 as of 10/92**  
**EZL resistance trimming coupling**

Basic and national versions

Engine	Model	Version/Code	EZL resistance trimming coupling designation	Ignition angle correction °CA	Resistance Ω/kΩ	Fuel
119	140 124 129	KAT/62/0, Ⓝ Ⓟ	015 545 67 28	0	2.4 kΩ	Super Plus 98 RON <sup>10)</sup> Premium 95 RON
		without KAT/828 Ⓜ	015 545 71 28	0	220 Ω	Super Plus 98 RON <sup>10)</sup>
		Ⓜ	015 545 68 28	-3	1.3 kΩ	Regular 91 RON
		KAT/62/0 without KAT/828 Ⓜ Ⓝ Ⓟ	015 545 69 28	-6	750 Ω if engine pings	Regular 91 RON

<sup>10)</sup> May also be used: 95 RON premium unleaded

**Engine 119.970/971 as of 01/91, engine 119.972 as of 09/92, engine 119.974 as of 01/92, engine 119.975 as of 10/92**  
**Assignment of LH resistance trimming plug**

Basic and national versions

Engine	Model	LH resistance trimming plug designation	Item no.	Resistance Ω	Fault
119	140 124 129	014 545 71 28 KAT	1	953	none (original state)
			2	1270	no operation
			3	1620	no operation
			4	2260	Poor engine running as well as <b>slight</b> pickup faults in warming-up phase
			5	3320	Poor engine running as well as <b>severe</b> pickup faults in warming-up phase
			6	5360	Engine cuts out after first start, poor engine running as well as <b>slight</b> pickup faults in warming-up phase
			7	11500	Engine cuts out after first start, poor engine running as well as <b>severe</b> pickup faults in warming-up phase
119	140 124 129	014 545 70 28 without KAT	1	51	none (original state)
			2	105	Pickup faults when engine at operating temperature
			3	169	Excessive fuel consumption at normal operating temperature
			4	249	Poor engine running as well as <b>slight</b> pickup faults in warming-up phase
			5	348	Poor engine running as well as <b>severe</b> pickup faults in warming-up phase
			6	442	Engine cuts out after first start, poor engine running as well as <b>slight</b> pickup faults in warming-up phase
			7	590	Engine cuts out after first start, poor engine running as well as <b>severe</b> pickup faults in warming-up phase



On KAT vehicles do not install resistance trimming plug with the inscription ECE otherwise the air pump will run constantly.